Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] 1. A method of manufacturing an x-ray detector sensor array for use with CT systems, the method comprising the steps of:
determining a high density material capable of changing in temperature upon absorption of radiation;
forming an absorption array having a plurality of absorption cells from the high density material; and
coupling a thermal sensing array having a plurality of thermal sensing cells to the absorption array.

[c2] 2. The method of claim 1 wherein the step of forming an absorption array includes the step of forming a sheet of the high density material.

[c3] 3. The method of claim 2 further comprising the step of etching the sheet to form a pixilated absorption array having a plurality of pixilated absorption cells.

[c4] 4. The method of claim 2 further comprising the step of laser-cutting the sheet to form a pixilated absorption array having a plurality of pixilated absorption cells.

[c5] 5. The method of claim 1 wherein the step of forming an absorption array includes the step of columnating the

high density material.

[c6] 6. The method of claim 1 wherein the step of forming an absorption array includes the steps of sputtering the high density material; and one of:
etching the high density material;
laser-cutting the high density material; and
masking the high density material.

[c7] 7. A CT detector array manufacturing process comprising the steps of:
shaping a bulk of high density material into a block;
pixilating the block to form a plurality of x-ray absorption component cells; and
affixing a plurality of thermal sensing cells formed in an array to the plurality of x-ray absorption component cells.

[c8] 8. The process of claim 7 wherein the step of pixilating includes the step of laser cutting the block along one dimension so as to form the plurality of x-ray absorption component cells.

[c9] 9. The process of claim 8 further comprising the step of laser cutting the block along another dimension perpendicular to the one dimension.

[c10] 10. The process of claim 7 wherein the high density ma-

terial is configured to experience detectable thermal changes upon reception of x-rays.

[c11] 11. The process of claim 10 wherein the high density material is further configured to experience thermal changes proportionally to the amount of x-rays received.

[c12] 12. The process of claim 11 wherein the plurality of thermal sensing cells is configured to detect thermal changes in the plurality of x-ray absorption component cells.

[c13] 13. The process of claim 7 wherein the block is formed of lead and the plurality of thermal sensing cells is further configured to output electrical signals indicative of x-ray absorption by the plurality of x-ray absorption component cells.

[c14] 14. A method of CT detector manufacture, the method comprising the steps of:
forming a sheet of x-ray absorption material;
etching the sheet such that an array of absorption components is formed; and
coupling an array of thermal sensing components to the array of absorption components.

[c15] 15. The method of claim 14 wherein the step of etching includes laser cutting the sheet along two dimensions.

[c16] 16. The method of claim 14 wherein the step of etching includes ion beam milling the sheet to form the array of absorption components.

[c17] 17. The method of claim 14 wherein the step of etching includes:
applying a mask to the sheet;
submersing the sheet in a chemical etchant;
removing the sheet from the chemical etchant; and
allowing the etchant to dry.

[c18] 18. The method of claim 14 wherein the step of etching includes:
applying a layer of plasma to the sheet;
loading the sheet in a vacuum chamber;
creating a vacuum in the chamber;
filling the chamber with a reactive gas;
creating a frequency field in the chamber;
energizing the layer of plasma to an energized state;
allowing the energized plasma to convert unprotected portions of the sheet to a number of volatile components; and
removing the volatile components with a vacuum.

[c19] 19. The method of claim 14 wherein the x-ray absorption material includes lead.

[c20] 20. The method of claim 14 wherein the array of thermal sensing components is configured to detect temperature changes in the array of x-ray absorption components.